E/CONF.39/D/125
SUMMARY
8 Jan.1963
ENGLISH
ORIGINAL : RUSSIAN

UNITED NATIONS CONFERENCE
ON THE APPLICATION OF SCIENCE AND TECHNOLOGY
FOR THE BENEFIT OF THE LESS DEVELOPED AREAS

SUMMARY

Agenda Item: D.1.4

Ukraine SSR

NEW ECONOMICAL METHODS OF HOUSING CONSTRUCTION

By S.S. ATAYEV,
Director,
Institute of Construction
and Architecture(Academy
of Sciences, Byelorussian SSR)

Papers have been contributed to the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas as working papers for that Conference. They are published as presented by the contributors, and the contents and the views expressed are those of the contributors. (See notes overleaf.)

NOTES

1. Papers selected for inclusion in General Sessions will be available at the Conference in the following official languages of the United Nations: English, French, Russian and Spanish.

2. Papers selected for inclusion in Specialized Sessions will be available at the Conference in only one of the above official languages.

3. Summaries of all papers, as submitted by contributors, will be available at the Conference in the following official languages of the United Nations: English, French, Russian and Spanish.

4. Papers and summaries will not be available for general distribution in advance of the Conference. They will be published in advance in limited quantities only for the use of delegations of participating governments and of other authorized participants. Post-Conference publication and general distribution of the Conference Proceedings will follow United Nations practices as laid down by the United Nations Publications Board.

NEW ECONOMICAL METHODS OF HOUSING CONSTRUCTION

by

S.S.Atayev
Director, Institute of Construction
and Architecture (Academy of Sciences,
Byelorussian SSR)

In recent years, the Soviet Union and Byelorussia, in particular, have developed technically efficient and economic methods of house building through the use of the three dimensional prefabricated blocks, which cover a wide technological range and are likely to be of practical importance for the underdeveloped areas.

When planning construction of houses made of prefabricated blocks two variants of dividing buildings into blocks are applicable : room-size blocks and extended two room size blocks for a building span.

From our point of view, the most suitable block for construction in underdeveloped areas is a room-size block. Such dimensions of prefabricated blocks are most convenient for manufacturing, transportation and erection.

Taking an elementary prefabricated block as a basis, it is possible to plan construction of bigger houses, beginning from multi-storeyed compact houses and ending in two- or three-storeyed buildings.

Proceeding from experience in manufacturing room-size prefabricated blocks, the following unit may be recommended as one which proved to be practically reliable.

The unit consists of a moulding machine, compressor installation, a system of steam and power supply and control panel. The moulding machine is made up of four couples hinged to one another and to the bottom of metal shields forming a rectangular mould. Hinged connections and adopted kinematic devices with a hydraulic drive ensure an accurate and synchronous withdrawal of outer shields and turning (opening) of inner shields.

The process of manufacturing a prefabricated room-size block is composed of the following operations : lubrication of the mould, installation of armature skeleton, laying of thermal insulation in outer walls, moulding of the prefabricated blocks, thermosteam treatment, opening of the unit, mounting of inner devices and ceiling panel, removal of the prefabricated block from the unit and delivery of the block to the finishing line.

The th rmal treatment optimum cycle of a prefabricated room-size block does not exceed six hours (1+4+1), correspondingly temperature risesup to 100^{0}, isothermic warming up at a temperature of 100^{0} and cooling. The technological conditions adopted will ensure regular manufacturing of three prefabricated room-size blocks a day.

With a proper organization of the manufacturing process, the plant should deliver prefabricated blocks with a complete finishing of the outer and inner walls,

glazing, with flooring laid, heating devices and air conditioning installations mounted, etc.

A peculiar character of house construction with prefabricated blocks requires a special attention to installation work.

Construction of houses of prefabricated blocks is carried out with the aid of ordinary boom-type crawler or pheumo-wheeled crane equipped with additional short horizontal booms, increasing the useful swing of the leading hook. Taking into account potential dynamic effects, the load-carrying capacity of the cranes should be by 15 or 20 per cent above the weight of the prefabricated block together with the rigging devices.

The experience obtained shows that the duration of one installation cycle including the operation of removing the block from the truck, hoisting, placing it in a mounting position and returning of the crane boom to the initial position, should not exceed 20 to 30 min. At a properly organized installation and delivery of prefabricated blocks, the erection of a four-storeyed house should take not more than 10 to 15 working days.

For transportation of room-size blocks, it is advisable to use trailers and trucks with platforms of a required load-carrying capacity, equipped with locking and shock-absorbing devices.

When the road conditions are poor, helicopters may be employed for transportation of room-size prefabricated blocks. However, as the use of helicopters to carry prefabricated blocks is rather complicated, these operations should be performed necessarily with participation of exports of the aircraft firm concerned.

The possibility of tranporting prefabricated blocks (namely, one-storeyed houses) by means of helicopters was successfully demonstrated during the last aircraft parade in Moscow.

The experience gained in construction of three dimensional prefabricated blocks in the USSR and in the Byelorussian SSR, in particular, permits to draw the following conclusions :

I. The enlargement of installation units and the transfer of nearly all the operations, excluding installation, to stationary conditions allows to fabricate blocks finished up to 85 per cent. By this method the total labour consumption of house construction is reduced sevenfold as against traditional construction and may be brought up to I man-day per I sq.m. of dwelling space. Construction time may be reduced by more than four times. The house weight also is decreased by 3.5 to 4 times.

2. The manufacturing of prefabricated blocks may be organized on the basis of simplest technology in field conditions which is accessible to the smallest construction firms. At the same time the peculiar character of house construction with prefabricated blocks facilitates the organization of large highly-mechanized enterprises with an efficient application of all-round mechanization and automation.

S - 456 E - Jan.1963 - 1,600